

REMARKS

By this amendment, claims 1-12 have been amended. Claims 1-13 remain in the application. This application has been carefully considered in connection with the Examiner's Action. Reconsideration, and allowance of the application, as amended, is respectfully requested.

The Drawings

By this amendment, Figures 1, 3 and 4 have been amended to include corrected reference numerals.

The Specification

The specification was objected to in view of grammatical errors and misspellings in the specification. By this amendment, the abstract and specification have been amended to correct grammatical errors and misspelled words. Accordingly, objection to the specification is now believed overcome.

Rejection under 35 U.S.C. § 112

Claims 3, 4, 5 and 12 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. By this amendment, claims 3, 4, 5 and 12 have been amended to clarify the same and to provide proper antecedent basis for the elements of the respective claims. Claims 3, 4, 5 and 12 are now believed allowable. Accordingly, the rejection of claims 3, 4, 5 and 12 should be withdrawn.

Rejection under 35 U.S.C. § 103

Claim 1

Claim 1 recites a method for merging a pair of overlapping two-dimensional (2D) images, wherein the images comprise projections of a single three-dimensional (3D)

scene, said method comprising: selecting at least four feature points in the 3D scene, finding 2D coordinates of points in both images corresponding to the selected feature points, the 2D coordinates being found with respect to original coordinate systems in the two images, translating the original coordinate systems of the two images to substantially minimize average coordinate ranges of the 2D coordinates found, determining parameters of a substantially optimal projective transformation relating corresponding translated coordinates in the two images, determining parameters of the projective transformation for application in the non-translated original coordinate systems of the two images by altering the projective transformation parameters in the translated coordinate systems using translation vectors that ensure an equivalence of the projective transformation in the original and translated coordinate systems is true, and merging the two images into a composite image by transforming one image according to the projective transformation into a transformed image and combining the transformed image with the other image.

Claims 1-3, 5-7, 9, 10 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable by Schultz et al ("Multiframe integration via the projective transformation with automated block matching feature point selection") in view of Jasinski et al (USPN 6,504,569).

Applicant traverses this rejection on the grounds that these references are defective in establishing a prima facie case of obviousness with respect to claim 1.

As the PTO recognizes in MPEP § 2142:

... The examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness...

It is submitted that, in the present case, the examiner has not factually supported a prima facie case of obviousness for at least the following, mutually exclusive,

reasons.

1. Even When Combined, the References Do Not Teach the Claimed Subject Matter

The Schultz and Jasinski references cannot be applied to reject claim 1 under 35 U.S.C. § 103 which provides that:

A patent may not be obtained ... if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains ...
(Emphasis added)

Thus, when evaluating a claim for determining obviousness, all limitations of the claim must be evaluated. However, since neither Schultz nor Jasinski teaches translating the original coordinate systems of the two images to substantially minimize average coordinate ranges of the 2D coordinates found, determining parameters of a substantially optimal projective transformation relating to corresponding translated coordinates in the two images, determining parameters of the projective transformation for application in the non-translated original coordinate systems of the two images by altering the projective transformation parameters in the translated coordinate systems using translation vectors that ensure an equivalence of the projective transformation in the original and translated coordinate systems is true, as is claimed in claim 1, it is impossible to render the subject matter of claim 1 as a whole obvious, and the explicit terms of the statute cannot be met.

In contrast, Schultz teaches an automated image registration algorithm based on projective transformation which accounts for cameral translation, rotation, zoom, pan and tilt, wherein feature selection is performed by a block matching algorithm. Jasinski, on the other hand, teaches extracting 3D data from a video sequence using a structure-from-motion algorithm, the motion parameters including a rotation matrix, a translation vector and a depth map representing the depth of each point in the background object from the camera. Jansinski also discloses generating a 2D

extended image from the motion parameters and the depth map using a plane perspective projection technique. Still further, Jansinschi discloses the need for dividing an image into identical image blocks, so that each block contains the same number of feature points to enforce that the feature points used in the estimation of the camera parameters span the whole extension of the input image, (Jansinschi at Col 6, lines 42-55).

Thus, for this mutually exclusive reason, the examiner's burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

2. The recognition of a problem, or of the source of the problem, is not obvious even though the solution to the problem may be obvious

In the present case, it is apparent from a reading of the Schultz reference and the Jasinschi patent that neither recognized the problem of translating the original coordinate systems of the two images to substantially minimize average coordinate ranges of the 2D coordinates found, determining parameters of a substantially *optimal projective transformation* relating to corresponding translated coordinates in the two images, determining parameters of the projective transformation for application in the non-translated original coordinate systems of the two images by altering the projective transformation *parameters* in the translated coordinate systems using translation vectors that ensure an equivalence of the projective transformation in the original and translated coordinate systems is true, as is claimed in claim 1. Thus, this is a classic example of a solution to a problem being obvious only after recognition of the problem by the applicant and is part of the "subject matter as a whole" language of 35 USC § 103 which should always be considered in determining the obviousness of an invention under this statute.

Thus, for this independent reason, the examiner's burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

3. The Combination of References is Improper

Assuming, arguendo, that none of the above arguments for non-obviousness apply (which is clearly not the case based on the above), there is still another, mutually exclusive, and compelling reason why the Schultz and Jasinski references cannot be applied to reject claim 1 under 35 U.S.C. § 103.

§ 2142 of the MPEP also provides:

...the examiner must step backward in time and into the shoes worn by the hypothetical 'person of ordinary skill in the art' when the invention was unknown and just before it was made.....The examiner must put aside knowledge of the applicant's disclosure, refrain from using hindsight, and consider the subject matter claimed 'as a whole'.

Here, neither Schultz nor Jasinski teaches, or even suggests, the desirability of the combination since neither teaches the particular combination of translating the original coordinate systems of the two images to substantially minimize average coordinate ranges of the 2D coordinates found, determining parameters of a substantially *optimal projective transformation* relating to corresponding translated coordinates in the two images, determining parameters of the projective transformation for application in the non-translated original coordinate systems of the two images by altering the projective transformation *parameters* in the translated coordinate systems using translation vectors that ensure an equivalence of the projective transformation in the original and translated coordinate systems is true, as specified above and as claimed in claim 1.

Thus, it is clear that neither patent provides any incentive or motivation supporting the desirability of the combination. Therefore, there is simply no basis in the art for combining the references to support a 35 U.S.C. § 103 rejection.

In this context, the MPEP further provides at § 2143.01:

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.

In the above context, the courts have repeatedly held that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination.

In the present case it is clear that the examiner's combination arises solely from hindsight based on the invention without any showing, suggestion, incentive or motivation in either reference for the combination as applied to claim 1. Therefore, for this mutually exclusive reason, the examiner's burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

Accordingly, claim 1 is allowable and an early formal notice thereof is requested.

With respect to claims 2-3, 5-7, 9, 10 and 13, the claims depend from and add further limitation, in a patentable sense, to allowable claim 1. Accordingly, claims 2-3, 5-7, 9, 10 and 13 are believed allowable.

Claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Schultz and Jasinski as applied to claim 1 above, and further in view of well known prior art. Applicant respectfully traverses this rejection for at least the following reasons. Claim 4 depends from and further limits, in a patentable sense, allowable independent claim 1 and therefore is allowable as well.

Claims 8, 11 and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Schultz and Jasinski as applied to claims 1 and 6 above, and further in view of Lobregt et al. (USPN 6,078,699). Applicant respectfully traverses this rejection for at least the following reasons. Claims 8, 11 and 12 depend from and further limit, in a patentable sense, allowable independent claim 1 and therefore are allowable as well.

Conclusion

It is clear from all of the foregoing that independent claim 1 is in condition for allowance. Dependent claims 2-13 depend from and further limit independent claim 1 and therefore are allowable as well.

The amendments herein are fully supported by the original specification and drawing, therefore, no new matter is introduced.

An early formal notice of allowance of claims 1-13 is requested.

Respectfully submitted,

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Attachments

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